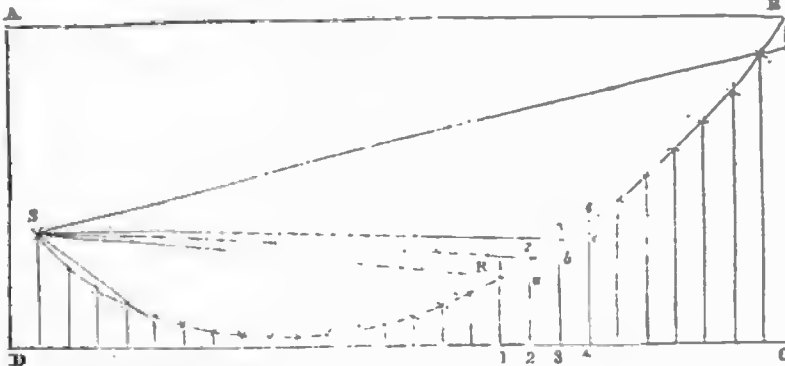


THIRTEENTH MEETING OF THE BRITISH ASSOCIATION—1843.

(Continued from page 348.)

The following diagram represents the isocoustic



"Let A B C D represent the vertical section of a building for public speaking, S the height of the speaker on his platform, D C the floor of the building: then, for the purpose that all the auditors should hear and see equally well, they should be placed on the line S R B of the acoustic curve. This curve is constructed in the following manner: D C is first divided into equal parts, to represent the usual breadth of a sitting, and vertical lines are drawn through these points. R being the place of the auditor 1; the place of auditor 2 behind him is assigned thus—join S R, and produce it to o—from a upwards set off $s 2 = 9$ inches, and 2 is the proper height of the next spectator. Then join S 2, produce it to b, and set off $b 3 = 9$ inches, and 3 is the place of the third spectator; and so on for the place of every spectator. Such was the vertical section of the building. The horizontal section was either circular or polygonal, having the speaker at the centre. This form had been found perfectly successful in affording the highest degree of comfort both to hearer and speaker; therefore he submitted it with confidence to the Section, as a practical and established principle, more than as a mere theoretical speculation."

GENERAL COMMITTEE—Monday, Aug. 21.

Invitations, not to be pressed unless circumstances required, were presented from Derby and Hull, but it was generally known that all parties had agreed to hold the next meeting at York; and a resolution to this effect was passed by acclamation. The following noblemen and gentlemen were elected office-bearers for the next year:—

Rev. J. Reacock, Dean of Ely, President.—Earl Fitzwilliam, Viscount Morpeth, J. S. Wortley, Esq., Sir D. Brewster, Professor Faraday, Rev. Vernon Harcourt, Vice-Presidents.—W. Hatfield, Esq., Rev. Mr. Scoresby, — Meynel, Esq., W. West, Esq., Secretaries.—W. Gray, Esq., Local Treasurer.

curve, or curve of equal hearing, referred to in Mr. Scott Russell's paper "On the Application of our Knowledge of the Laws of Sound to the Construction of Buildings."

It was resolved, that the meeting should be held in the course of September, the particular day to be determined by the London Council. The following gentlemen were appointed to the Council for the ensuing year:—Sir H. de la Beche, Dr. Buckland, Dr. Daubeny, Prof. T. Graham, G. B. Greenough, Esq., Leonard Horner, Esq., Eaton Hodgkinson, Esq., Robert Hutton, Esq., Sir Charles Lemon, C. Lyell, Esq., Prof. Lloyd, D. Macneil, Esq., Prof. McCullagh, the Marquis of Northampton, Prof. Moseley, Dr. Richardson, Prof. Sedgwick, Col. Sykes, W. Thompson, Esq., Prof. Wheatstone, Rev. Mr. Whewell, and Dr. Williams, with the officers of the Association. The general secretaries and treasurer were re-elected.

SECTION G, MECHANICAL SCIENCE—Saturday, Aug. 19.

The first subject for discussion being Mr. Dircks' method for the prevention of smoke, as applicable to steam-engine and other furnaces.

Mr. Dircks said the subject was one of particular interest at the present time, a parliamentary committee having been appointed to inquire into the feasibility of burning or preventing smoke, with a view to promote the health of towns. He briefly recapitulated the principle and arrangement of the Argand Furnace of Mr. C. Wye Williams, which admitted the air in the divided form of jets of air. The advantage of the plan he described as demonstrated by the indications of Mr. Houldsworth's pyrometer. This view he further supported by reference to tables of the relative calorific and commercial value of fuels for evaporative purposes, drawn up with much care, and giving, among other data, the escape of heat in the chimney as indicated by a pyrometer, shewing a range of temperature from 240° to $1,020^{\circ}$, in other words, a loss of power equal to the evaporation of an increased quantity of water, but which is wholly overlooked in practice. The following is the table exhibited:—

No. of Experiment.	DESCRIPTION OF FUEL.	Pounds weight of fuel burnt per hour.	Pounds weight of water evaporated per hour.	Pounds weight of water evaporated per pound of fuel.	Average heat of this most efficient fuel from the furnace.	Temperature of product of combustion at foot of the chimney.	Cost of fuel for evaporating 100 cubic feet of water.	Condition of furnace as to admission of air to the gases.
1	Turf. Quality obtained in wet seasons—clump	456	883	1.93	450	300	5 8	Air admitted to gases as well as to sub-pit—no smoke.
2	Turf. Same as last experiment	456	1144	2.50	523	496	4 4	Air excluded from gases (on old system)—much smoke.
3	Turf. Quality obtained in good seasons—dry	443	1360	3.07	673	593	3 7	Air admitted—new system—no smoke.
4	Bituminous—C. W. Williams's plan	393	1073	2.73	833	711	4 76	Bitum. ditto
5	Turf. Plain—same as No. 3	353	1733	4.93	773	613	3 9	Ditto, ditto
6	Bituminous—same as No. 4, 40 parts	160	633	3.95	316	454	16 1	Air excluded from gases—old system—much smoke.
7	Coal, ditto.	334	1716	5.13	1193	1020	6 4	Air admitted—new system—no smoke.
8	Coal (Liverpool)—bituminous	160	993	6.20	303	340	7 04	Air excluded—old system—much smoke.
9	Coal, same as No. 8.	179	1360	7.59	760	813	6 8	Air admitted—new system—some smoke.

In the above, the turf is taken at 6d. per statute box of 30 cubic feet. The bituminous turf at 10s. per ton, although it can be manufactured considerably under that price in many localities; and the coal at 10s. per ton.

After a few observations from Mr. Taylor, at the conclusion of Mr. Dircks' address, in which he wished to shew that there were some objections to the plan proposed, which would be obviated if furnaces were heated on Mr. Meller's plan.

Mr. Taylor, Treasurer to the Association, said that it was only a week since he left Cornwall, for the purpose of attending the present meetings of the Association. That before he left, the great engine owners of that district, including himself, had tried all the plans now before Government and the country, their object being to arrive at the best method of economising fuel, which to them was an object of the greatest importance. The result which he and others arrived at, after a series of experiments, was, that different plans succeeded at various times, success in almost every instance depending more upon the attention and care of the engineer than on the excellence of the plans themselves. In Cornwall, the capability of every engine was known, and the spirit of emulation excited among the engineers, and the pride they felt in making them perform the greatest quantity of work with a small supply of fuel, was well known to the proprietors, and found most advantageous to them. Whenever the services of a person was required, he was acquainted with the performance which the engine had previously made, and if he did not make it maintain the same action, his salary was reduced, or his services dispensed with.

Doctor Scoresby said that he came from the region of smoke, where the practicability of its removal, diminution, and conversion into heat, thereby ensuring an economy of fuel, had been frequently tried in the extensive factories in Lancashire, every plan that has been recommended as immediately tested, and the conclusion that he came to from a careful examination of the subject was, that a very indifferent plan succeeded better than a very good one when the person in charge of the fire happened to be attentive and experienced. There was one thing greatly to be censured in the conduct of engineers and proprietors of factories, that is, leaving the care of supplying the fuel to an inferior class of persons, called stokers, who are very poorly paid, and consequently cannot be supposed to possess much of engineering or mechanical knowledge. He happened to visit a factory a short time since where a plan for the prevention of smoke had been most successfully tried. At the time of his visit the proprietor of the establishment was absent, but on being made aware of the object for which he came, the fireman began to heap coals upon the furnace, as the fire was very slack at the time; the result was that the chimney smoked to a degree which confirmed him in the opinion he had already formed, that the most efficacious way in every instance would be to preserve a strong, clear fire, and gradually feed it with coals, a free current of air to the furnace being most requisite.

ECONOMY OF FUEL.

Mr. Chanter.—Ladies, my lords and gentlemen, I have the honour to appear before you to explain the various modes adopted for the economy of fuel as well as the prevention of smoke, and which is my intention to compress in as short a space as this valuable subject will admit of. The inquiries of the legislature having, during the last month, been directed to the best mode of economising fuel in furnaces, and the prevention of the nuisance of smoke therefrom, numerous plans have been submitted to the Committee of the House of Commons appointed for undertaking the investigation, the details of which will, I understand, shortly be published. The inquiries of the Committee have not only been directed to ascertain what plans are in practical use to prevent smoke, but to the most efficient means which have been adopted to economize the greatest quantity of fuel at the least expense, so as to induce manufacturers, distillers, brewers, and others who not only use large quantities of fuel, but who produce the largest quantities of smoke of the most noxious character, to adopt the plan which, by experience, has been found the most successful. My attention has been directed to this subject for the last fourteen years, and I flatter myself, that I have carried out the principle required with success, and that I can apply the same with advantage to every description of boiler, at the same time guaranteeing a very large economy of fuel, whilst preventing the formation and distribution of smoke. To elucidate my plans, I beg to call your attention to some drawings and models, to illustrate part of my arrangements. Nos. 1, 2, 3, are applications to steam boilers. No. 1 to a wagon boiler; the universal plan with few exceptions in Lancashire and Yorkshire. No. 2, a defective boiler, and No. 3, the Cornish boiler, which is considered to generate a larger proportion of steam than other forms. It will be perceived that by my arrangements, I possess the power of regulating the exact quantity of atmospheric air which is required, and which I introduce through a pipe or pipes at the furnace door. In conjunction with this there is a slight hole through which the state of combustion in the interior may be perceived. The air is carried